

BENCHMARKS

VOLUME 7 NUMBER 6

NORTH TEXAS STATE UNIVERSITY

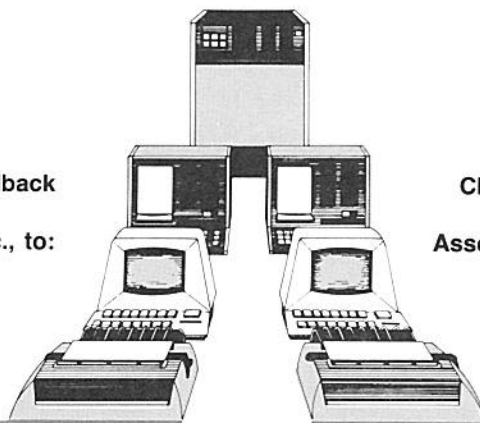
JUNE 1986

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BENCHMARKS Reader/User feedback is encouraged.

Send all letters, suggestions, etc., to:
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SERVICES AVAILABLE TO USERS OF THE NTSU COMPUTING FACILITIES

The NTSU Computing Center is located in the Information Sciences Bldg., Room 119. Telephone: (817) 565-2324. HELP DESK phone: 565-4050. Graphics Lab phone: 565-3479

BENCHMARKS QUESTIONS/CONTRIBUTIONS, ETC. - Claudia Lynch

INFORMATION & ID CODES; DISK SPACE PROBLEMS - Carolyn Goodman

PRE-RESEARCH COUNSELING; STATISTICAL/RESEARCH SUPPORT - George Morrow, Scott Barber, Claudia Lynch, Tim King, Panu Sittiwong

ACADEMIC ADABAS/COM-PLETE; CRSP & COMPUSTAT PROBLEMS - Telka Clem

STUDENT PROGRAMMING PROBLEMS - CSCI Dept., GAB Room 542A; BCIS Dept., BA Room 152

JCL PROBLEMS; PASSWORD & OPERATING SYSTEM PROBLEMS; COMMUNICATION/TERMINAL PROBLEMS - Help Desk

DATA ENTRY & KEYPUNCH; TEST SCORING & ANALYSIS - Betty Grise

ADMINISTRATIVE APPLICATIONS - Coy Hoggard

PRINTOUT RETRIEVAL - RJE Operators

DIALING UP NTSU COMPUTERS OVER THE TELEPHONE

Phone numbers for the Local Area Network (LAN) are:

300 BAUD: (817) 565 - 3300
1200 BAUD: 565 - 3499
300 BAUD: D/FW METRO 429 - 6006

After a communications link has been successfully established, the user will receive the # prompt. At this point, it will be necessary to issue the appropriate CALL command to connect with a computer.

The numbers that will accept either 300 or 1200 baud communications (connected to modems with an autobaud feature) are currently out of order. Watch MUSIC/SP News and *Benchmarks* for information concerning their availability.

CALL 8040 will connect with the NAS/8083 for MUSIC/SP 8050 access)
8060

CALL 3270 will connect with the NAS/8083 through 3280 the 3270 protocol converter

CALL DEC will connect with the VAX Cluster
CALL 780 will connect with the Research VAX

CALL 2000 will connect with the HP-2000

NTSU CABLE SYSTEM SCHEDULE

The current configuration of the NTSU cable system is as follows:

Channel 8 — Tager microwave channel. Carries broadcasts to and from NTSU to other links in the Tager network.

Channel 10 — NTSU Computer System Status Monitor (SSM). Displays the current status of the NAS, VAX and HP computer systems supported by the Computing Center.

Channel 7 — NT Daily. Broadcast originates from the NTSU Journalism Department.

Channel 12 — Sammons Cable. Currently broadcasts Cable News Network (CNN), unless a special program is requested.

Special broadcasts to and from classrooms (on channel 11), etcetera can be arranged by contacting the Media Library (565-2484).

HOURS FOR NTSU COMPUTER ACCESS AREAS***SUMMER 1986*:**

<u>Days</u>	<u>Times</u>	<u>Location</u>
Sunday	2-10 p.m. Noon-Midnight 1-8 p.m.	ISB 110 Terminal Area Computing Center RJE GAB 550C
Saturday, Sunday	Noon-11:45 p.m. Noon-5 p.m.	College of Business Graphics Lab
Monday	7:00 a.m.-Midnight	Computing Center RJE
Tuesday-Saturday	7:00 a.m.-Open 24 hrs/day	Computing Center RJE
Monday-Thursday	7:30 a.m.-10 p.m. 8:15 a.m.-11:45 p.m. 8 a.m.-11 p.m. 8 a.m.-10 p.m.	ISB 110 Terminal Area College of Business GAB 550C Graphics Lab
Friday	7:30 a.m.-6 p.m. 8:15 a.m.-7:45 p.m. 8 a.m.-5 p.m. 8 a.m.-6 p.m.	ISB 110 Terminal Area College of Business GAB 550C Graphics Lab
Saturday	9 a.m.-6 p.m. CLOSE Midnight 11 a.m.-6 p.m.	ISB 110 Terminal Area Computing Center RJE GAB 550C

*Hours on finals days and between sessions may vary. Check MUSIC/VAX News and/or posted schedules for exceptions.

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*      PROCEDURES,
*      AND OTHER
*      IMPORTANT
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Academic and Administrative Computer Systems Upgraded

The academic NAS/8043 and the administrative NAS/6650 were upgraded to a dual processor NAS/8083 on Saturday, the 24th of May. This was the result of a series of steps that were begun on Saturday, May 17th. The schedule went as follows:

- 5/17 8:00 a.m. : The academic NAS/8043 was shut down for an upgrade to an NAS/8063.
- 5/18 4:00 p.m. : Academic CPU back online (now as a NAS/8063). This was about 8 hours behind schedule due to a failed card in the original NAS/8043. The failure may have been caused by the physical move of the machine (about 40 feet), or by the repeated power-down/up required by the upgrade. Another original card began having intermittent failures on 5/19 and was replaced. There were no additional problems.
- 5/24 8:00 a.m. : Academic NAS/8063 and Administrative NAS/6650 shut down for installation of the "second half" of the dual processor NAS/8083. (The academic NAS/8063 [upgraded from the old NAS/8043] and a new administrative NAS/8063 [the old NAS/6650 will be sold] were physically joined together.) One string (8 volumes) of 3380 disk drives were also installed on the administrative CPU.
- 5/26 9:00 a.m. : The dual processor NAS/8083 came online. This was approximately one hour behind schedule due to a very minor problem with one of the consoles.

It's User ID Renewal Time!!!

By Carolyn Goodman, Administrative Assistant for Computer Services
(FA18@NTSMUSIC)

Academic User ID-Codes are assigned and valid for the period September 1 through August 31 of the following year. Therefore, all current User ID-Codes - ON ALL SYSTEMS - will be expiring August 31, 1986.

If you wish your ID-Code to be valid and active after September 1, 1986, it is necessary to complete the ID-Code Request Form "Renewal FY87." If you plan to be away part or most of the summer and wish to use your current ID-Code during the fall semester, you should *definitely* plan to complete this form before leaving campus for the summer. All ID-Codes will be deactivated September 1st, so renewing early will ensure that your account and all accumulated files contained within will remain active.

If you have any questions regarding ID-Code renewal procedures, please feel free to contact me at the Computing Center (565-2324, ISB 119).

Computing Center Summer II Short Courses

The Computing Center is offering the following short courses for the second summer session. Please pre-register to attend. Only 20 people will be admitted per section. Courses marked with an * require knowledge of the MUSIC Context Editor. THE COMPUTING CENTER RESERVES THE RIGHT TO CANCEL COURSES WITH LESS THAN 5 PEOPLE SIGNED UP.

1. Separate 2-hour introductory sessions on the MUSIC/SP interactive operating system, using the 3270 Protocol Converter to do FULL-SCREEN EDITING ON MUSIC/SP. To be held in Room 110 of the Science Library (ISB).

Saturday, July 19	: 9-11 a.m.	Instructor: Janice Green
Wednesday, July 23	: 6-8 p.m.	Instructor: Telka Clem
Thursday, July 24	: 1-3 p.m.	Instructor: Tim King

2. A two-hour session on save Files in SAS and SPSS-X. To be held in the Graphics Lab (ISB):
Monday, July 21 : 9-11 a.m. Instructor: Scott Barber
3. A three-hour session on VAX Utilities & Commands. To be held in Room 110 of the Science Library (ISB).
Monday, July 21 : 6-9 p.m. Instructor: Ron Brashear
4. A two-hour introductory session on SAS.* To be held in Room 110 of the Science Library (ISB).
Monday, July 21 : 1-3 p.m. Instructor: Tim King
5. A two-hour session on using MUSIC/SP Utilities.* To be held in Room 110 of the Science Library (ISB).
Friday, July 25 : 9-11 a.m. Instructor: Janice Green
6. A two-hour introductory session on SPSS-X.* To be held in Room 110 of the Science Library (ISB).
Wednesday, July 23 : 8-10 a.m. Instructor: Panu Sittiwong
7. An introductory on using SAS/GRAPH. To be held in the Graphics Lab (ISB).
Wednesday, July 23 : 1-3 p.m. Instructor: Mansur Hasib

Errors in SAS

We have been advised by SAS Institute Inc. that the following errors have been found in the versions (5.08) of SAS that we currently have installed on OS/MVS and CMS.

SAS/ETS Software (OS): PROC X11 - When TDREGR=TEST is specified along with PRINTOUT=NONE in the MONTHLY statement, the final series will not be adjusted even if the trading day regression is significant. PRINTOUT=STANDARD, FULL, or LONG will correctly apply the adjustment. To avoid this problem, use PRINTOUT=STANDARD along with TDREGR=TEST, and redirect the listing to a dummy file.

SAS/GRAPH Software (CMS): PROC GCONTOUR - Numbers on the axes produced by PROC GCONTOUR may be incorrect. To determine whether your numbers are correct, compare the minimum values in your data. If the values do not match, the axis values are incorrect.

These errors will be corrected in the next version of SAS, scheduled to be shipped before the end of the year.

A serious error has been found in SAS Base Software running on both OS and CMS. PROC SUMMARY produces incorrect sums of squares and incorrect statistics based on sums of squares (such as variance, standard deviation, etc.) for all levels of interaction except for the lowest level. Also, PROC CORR on both OS and CMS has an error which causes a dataset with missing values that uses the WEIGHT and WITH statements to produce incorrect values. A fix for these errors is available and has been ordered. If you have been running these procedures, please check your results. We will notify you as soon as PROC SUMMARY and PROC CORR are working properly.

We have also fixed the following errors:

PROC CANCORR, PROC FACTOR, PROC PRINCOMP, PROC RSQUARE, and PROC VARCLUS on both OS and CMS had an error which caused erroneous results to be produced when using BY groups. The first BY group was calculated correctly but subsequent ones were not. The problem resulted from a subroutine failing to zero out the last row of the matrix used to collect cross products. It did not occur if you supplied TYPE=CORR data sets to the procedures, rather than original data. This error was fixed 5/9/86, so if you ran any of these procedures under the conditions that would give erroneous results before that time, you should rerun them now.

New ALA Printing Environment Available on the Laser Printer

By Lynne Rutherford, Supervisor of Computer Operations (AO02@NTSMUSIC)

A new printing environment containing various foreign language characters is available on the HP 2680A Laser printer. It includes the characters which were previously available only by use of the ALA train, a special print train used on an impact printer.

To call this new print environment, include either ALA1, ALA2, ALA3, or ALA4 in the DD statement in your JCL (depending on number of copies needed).

General characteristics of this ALA environment are the same as in TN01 - 10 characters per inch, 90 degree rotation, 77 characters per line, 66 lines per page, and Standard "Courier" style characters. To get a single copy of output in the ALA environment, the DD statement should read: //SYSPRINT DD SYSOUT=(A,,ALA1)

To access this environment you can use Waterloo/SCRIPT or MUSIC/SCRIPT. Both have a "translate" feature (.TR) which allows you to substitute a character on your keyboard for one that is not available. (Consult the Waterloo/SCRIPT Reference Manual or the MUSIC/SCRIPT User's guide for more information on the .TR command). It is also possible to obtain the desired characters by defining your input as HEX and typing in the appropriate hexadecimal equivalent for the character.

To print a character such as an acute accent which goes over a letter, use the .tr command to define a character on your keyboard as a back space character. The hex code for back space is 16. An example of this would be:

.tr % 16 -----> defines % as the back space character

.tr \$ 74 -----> defines \$ as 74 (Hex code for acute accent)

French for 'debate' is 'de%\$bat'.-----> Input text. Output prints as:

French for debate is 'débat'.

An effort was made to create the new characters with the same HEX code as had been used with the ALA train. In the case of two characters this was not possible. These are the tilde, which was called by HEX A1 when using the ALA train but must be called by HEX AC when using the ALA1 environment on the laser printer; and the grave accent, which was called by HEX 79 on the ALA train and may be called by either HEX 79 or HEX 90 in the ALA1 environment.

CHARACTER .. HEX CODE CHARACTER DESCRIPTION

0	.....	80	.....	subscript 0
1	.....	51	.....	subscript 1
2	.....	52	.....	subscript 2
3	.....	53	.....	subscript 3
4	.....	54	.....	subscript 4
5	.....	55	.....	subscript 5
6	.....	56	.....	subscript 6
7	.....	57	.....	subscript 7
8	.....	58	.....	subscript 8
9	.....	59	.....	subscript 9
+	.....	CA	.....	subscript +
-	.....	CB	.....	subscript -
(	.....	BC	.....	subscript (
)	.....	CC	.....	subscript)
0	.....	B0	.....	superscript 0
1	.....	B1	.....	superscript 1
2	.....	B2	.....	superscript 2
3	.....	B3	.....	superscript 3
4	.....	B4	.....	superscript 4
5	.....	B5	.....	superscript 5
6	.....	B6	.....	superscript 6
7	.....	B7	.....	superscript 7
8	.....	B8	.....	superscript 8
9	.....	B9	.....	superscript 9
+	.....	8E	.....	superscript +
-	.....	8F	.....	superscript -
(	.....	8D	.....	superscript (
)	.....	9D	.....	superscript)
1	.....	68	.....	i without dot for use with accents - í, î.
^	.....	74	.....	acute accent
~	.....	69	.....	double acute accent

'	.....	ED	.....	alif (high comma)
α	.....	AA	.....	alpha
\	.....	E0	.....	backslash
β	.....	AB	.....	beta
˘	.....	77	.....	breve
£	.....	DB	.....	British pound
¸	.....	76	.....	cedilla (ç)
°	.....	70	.....	circle above
◊	.....	EA	.....	circle below
^	.....	71	.....	circumflex
Ð	.....	44	.....	D with crossbar (upper case)
ð	.....	64	.....	D with crossbar (lower case)
Æ	.....	46	.....	Digraph (upper case)
æ	.....	66	.....	Digraph (lower case)
Œ	.....	47	.....	Digraph (upper case)
œ	.....	67	.....	Digraph (lower case)
‡	.....	9A	.....	double dagger
.	.....	DE	.....	dot below
..	.....	DF	.....	double dot below
.	.....	49	.....	dot in middle
.	.....	75	.....	superior dot
=	.....	EB	.....	double underscore
ˇ	.....	78	.....	hacek
`	.....	79	.....	grave accent (è)
´	.....	90	.....	grave accent (ê)
¸	.....	FA	.....	ligature (left)
¸	.....	FB	.....	ligature (right)
-	.....	A0	.....	macron
Ł	.....	42	.....	Polish L (upper case)
ł	.....	62	.....	Polish L (lower case)
¸	.....	CF	.....	right hook
Ø	.....	43	.....	Scandinavian O (upper case)
ø	.....	63	.....	Scandinavian O (lower case)
'	.....	EE	.....	tail
Þ	.....	45	.....	Thorn (upper case)
þ	.....	65	.....	Thorn (lower case)
~	.....	AC	.....	tilde
¨	.....	72	.....	umlaut (for lower case letters - ö)
¨	.....	73	.....	umlaut (for upper case letters - Ö)

Editor's Note: If you have "The Hewlett-Packard 2680A Laser Printer" Reference Card, you should probably make note of this new environment file on it.

Second Satellite Symposium on Artificial Intelligence

June 25th marks the second annual broadcast by Texas Instruments of the "Satellite Symposium on Artificial Intelligence." This year's focus is on "Knowledge-Based Systems: A Step-By-Step Guide to Getting Started." If you watched the broadcast last year, you will recognize the procedure that is planned for this years viewing. The University will receive the symposium over the Tager microwave channel - channel 8. If you are unable to watch the symposium, it will be recorded by the Media Library for future viewing. There are also plans to broadcast the symposium in Denton on channel 36. If you would like to order the symposium proceedings/sourcebook (\$29.95 plus tax), send your request to:

Texas Instruments
AI Satellite Symposium II
P.O. Box 181153
Austin, Texas 78718

You can order by credit card by calling 1-800-527-3500.

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Disk Backup Schedules

Backup Schedule for OS/MVS

OS/MVS disk packs (academic and administrative) are backed up daily, Tuesday through Saturday, from 4-6:30 a.m., and Sunday from Midnight to 3 a.m. A backup of all the operating systems on the NAS machines and their contents is done once every two weeks at some low activity period over a weekend.

MUSIC/SP Backup Hours

A message will be sent to all users signed on to MUSIC/SP approximately 10 minutes before backups are begun. It will be in the form **MUSICSHUTDOWN AT xxxx AM - SCHEDULED BACKUP**. To find out the backup hours while signed on to MUSIC/SP, enter HELP HOURS. The following backup schedule is currently in effect:

Tuesday	3 a.m. (for about 3 hours)	Weekly backup
Wednesday - Saturday	4 a.m. (for about 2 hours)	Daily backup
Saturday	Midnight (for about 2 hours)	Daily backup

PHOENIX Backup Schedule

PHOENIX is backed up weekly on Sunday night. The backup begins at midnight and lasts for approximately 30 minutes.

VAX Backup Schedule

Incremental backups of both VAX systems are performed Monday through Thursday at 4 p.m. Users do not have to log-off, but any files that are open at the time of the backup will NOT be backed up.

Full backups of both systems are done every Friday beginning at 8 a.m. These generally will take all day to complete. Again, users do not have to log-off, but any files that are open will not be backed up.

A "Stand Alone" backup of the system disk is done the third Tuesday of every month, in the afternoon, just before preventive maintenance. This procedure makes a copy of the system disk that can be used to restore its contents if the disk is completely destroyed. The system will be shut down; watch the system log-on message for specific times and dates.

NOTE: No backups are taken on the weekends. Requests for restoration of files should be made via MAIL to the username OPERATOR. Your file can only be restored if it existed before the last backup was done.

NAS Performance Statistics for May

CPU	SYSTEM	SCHEDULED OPERATING HOURS	PLANNED MAINT. HOURS	PLANNED PRODUCTION HOURS	UNPLANNED MAINT. HOURS	PRODUCTION HOURS ACHIEVED	SYSTEM UPTIME
8043	VM/SP3	744	69.65	674.35	4.45	669.90	99.3%
8043	MUSIC/SP	744	101.65	642.35	16.53	625.82	97.4%
8043	MVS/JES2	744	91.84	652.16	7.14	645.02	98.9%
8043	COMPLETA	744	92.15	651.85	8.48	643.37	98.7%
6650	MVS/JES2	744	36.80	707.20	7.24	699.96	99.0%
6650	COMPLETEA	282	1.28	280.72	8.68	272.04	96.9%
6650	ADABASA	744	62.30	681.70	9.70	672.00	98.6%

System Uptime = (Production Hrs. Achieved)/(Planned Production Hrs.)

Production Hrs. Achieved = (Planned Production)-(Unplanned Maint.)

Scheduled Operating Hrs. = (Planned Maint.) + (Planned Production)

MUSIC/SP Planned Maintenance Hours include 17.86 Hrs. for system backup and 13.66 hours for VM/SP3 system backup.

ADABASA'S Planned Maintenance Hours include 25.05 Hrs. for system backup.

The NAS/8043 CPU achieved 100% uptime. The NAS/7360 DASD achieved 100% uptime. The NAS/7350 DASD achieved 100% uptime. The NAS/6650 CPU achieved 100% uptime. The STC 8650 DASD achieved 100% uptime. The NAS/8063 upgrade for the academic computing system achieved 97.9% uptime. The NAS/8083 upgrade for the academic computing system achieved 100% uptime. The NAS/8083 upgrade for the administrative computing system achieved 100% uptime.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation. Lost productivity hours were contributed to by the following key causes:

NAS/8043 CPU:

CPU, Tape, and Disk Subsystems (NAS)

1. 8043 to 8063 upgrade	32.95 HOURS
2. I/O Processor Failures after 8063 upgrade	3.07
3. 8083 Dual Processor Upgrade/Installation	37.60
	73.62 HOURS

Miscellaneous

1. Undetermined causes for system restarts	3.51
2. Operator missed step in alternate start up procedure for the MUSIC/SP system.	4.68
3. The UPS auxiliary power system tripped out during a series of thunderstorms	2.17
4. MUSIC/SP system failures	2.02
5. MUSIC/SP system tuning/improvements	2.90
6. MVS/JES2 system tuning/improvements	1.22
7. MVS/JES2 system upgrade (version 1.3.4)	21.60
8. COMPLETA system tuning/improvements	0.14
	TOTAL 38.24 HOURS

GRAND TOTAL FOR NAS/8043 111.86 HOURS

NAS/6650 CPU:

CPU, Tape, and Disk Subsystems (NAS)

1. 8083 Dual Processor Upgrade/Installation	31.25 HOURS
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ISB Input/Output Station (CIS TECH)

1. IBM 2821 I/O Controller errors caused Channel Detect Errors on BYMPX 0.	3.94
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Miscellaneous

1. Undetermined Causes for System Restarts	1.43 HOURS
2. Power failures in ISB caused BYMPX 0 to fail	1.17
3. The UPS auxiliary power system tripped out during a series of thunderstorms	2.33

4. COMPLETA shut down to process single jobs	3.67
5. MVS/JES2 system tuning/improvements	1.30
6. COMPLETA system tuning/improvements	0.93
7. COMPLETA system failures	0.70
TOTAL	11.53 HOURS
GRAND TOTAL FOR NAS/6650	52.72 HOURS

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Academic (NAS) Program Hit Parade

The following programs were used the most frequently on the NAS/CPU during May.

MAY TOP TEN PROGRAMS IN TERMS OF FREQUENCY OF RUNS

Program	Description	Number of Runs	Percent of Total
1. OTHER	Programs not Categorized	11137	15.9
2. IEWL	Linkage Editor	10553	15.0
3. PGM=*.DD	Compiled Program	10375	14.8
4. SCRIPT	Waterloo/SCRIPT	7348	10.5
5. IEBGENER	IBM Utility	6953	9.9
6. IKFCBL00	VS COBOL Compiler	6720	9.6
7. SASLPA	SAS	4892	7.0
8. IFOX00	System Assembler	3073	4.4
9. PTPCH	Dataset Lister	2470	3.5
10. IEBPTPCH	IBM List Utility	1940	3.8

MAY TOP TEN PROGRAMS IN TERMS OF CPU SECONDS USED

Program	Description	CPU Seconds	Percent of Total
1. SASLPA	SAS	31752	22.9
2. PGM=*.DD	Compiled Program	27679	20.0
3. OTHER	Programs not Categorized	20922	15.1
4. SCRIPT	Waterloo/SCRIPT	19686	14.2
5. IKFCBL00	VS COBOL Compiler	12191	8.8
6. IFOX00	System Assembler	7545	5.4
7. IEWL	Linkage Editor	5411	3.9
8. PTPCH	Dataset Lister	3235	2.3
9. IEBPTPCH	IBM List Utility	1846	1.3
10. IGIFORT	FORTTRAN G1	1536	1.1

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*   SYSTEMS       *
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Information Systems News

By Coy Hoggard, Manager of Information Systems

The Information Systems group hired two new employees in the month of April. Both are officially TCOM employees and will work in the NTSU/TCOM Fiscal Systems Team.

De An Williams has joined our group as a Programmer. She comes to us from San Diego (California) Gas & Electric Co., where she was employed for approximately one and one-half years as a Programmer. De An is a native of Hurst, and has a BA from UT Arlington, with a major in Spanish. She currently lives in Hurst with her husband, David, and son, Robert (five months old). De An's primary ("home") office will be at TCOM in Fort Worth.

Dan Strange has joined our group as a Programmer/Analyst. Dan comes to TCOM/NTSU from Texas Instruments where he was employed as a Programmer / Analyst for the past three years. Dan is a native of Dallas, and is a graduate of NTSU. He received a BBA in Accounting from UT Austin in 1978 and a MS in Accounting (with emphasis in Information Systems) from NTSU in 1985. Dan is a Certified Public Accountant. He and his wife, Carol, were already living in Denton prior to Dan's accepting the position at NTSU. Carol is employed by Zoecon Corp. in Farmers Branch as an Environmental Chemist. Even though he is "officially" a TCOM employee, Dan's primary ("home") office location will be at NTSU.

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*   HUMOR      *
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Real Programmers Don't Use Pascal - PART I

Contributed to *NutWorks*, Electronic Humor Magazine. Issue 3, Volume II, by Chris Condon (BITLIB@YALEVMX)

Back in the good old days — the "Golden Era" of computers, it was easy to separate the men from the boys (sometimes called "Real Men" and "Quiche Eaters" in the literature). During this period, the Real Men were the ones that understood computer programming, and the Quiche Eaters were the ones that didn't. A real computer programmer said things like "DO 10 I=1,10" and "ABEND" (they actually talked in capital letters, you understand), and the rest of the world said things like "computers are too complicated for me" and "I can't relate to computers — they're so impersonal". (A previous work points out that Real Men don't "relate" to anything, and aren't afraid of being impersonal.)

But, as usual, times change. We are faced today with a world in which "little old ladies" can get computers in their microwave ovens, 12-year-old kids can blow Real Men out of the water playing "Asteroids" and "Pac-Man", and anyone can buy and even understand their very own Personal Computer. The Real Programmer is in danger of becoming extinct, of being replaced by high-school students with TRASH-80's.

There is a clear need to point out the differences between the typical high-school junior "Pac-Man" player and a Real Programmer. If this difference is made clear, it will give these kids something to aspire to — a role model, a Father Figure. It will also help explain to the employers of Real Programmers why it would be a mistake to replace the Real Programmers on their staff with 12 -year-old "Pac-Man" players (at a considerable salary savings).

LANGUAGES

The easiest way to tell a Real Programmer from the crowd is by the programming language he (or she) uses. Real Programmers use FORTRAN. Quiche Eaters use Pascal. Nicklaus Wirth, the designer of Pascal, gave a talk once at which he was asked "How do you pronounce your name?". He replied, "You can either call me by name, pronouncing it 'Veert', or call me by value, 'Worth'." One can tell immediately from this comment that Nicklaus Wirth is a Quiche Eater. The only parameter passing mechanism endorsed by Real Programmers is call-by-value-return, as implemented in the IBM-370 FORTRAN-G and H compilers. Real programmers don't need all these abstract concepts to get their jobs done — they are perfectly happy with a keypunch, a FORTRAN IV compiler, and a beer.

- * Real Programmers do List Processing in FORTRAN.
- * Real Programmers do String Manipulation in FORTRAN.
- * Real Programmers do Accounting (if they do it at all) in FORTRAN.
- * Real Programmers do Artificial Intelligence programs in FORTRAN.

If you can't do it in FORTRAN, do it in assembly language. If you can't do it in assembly language, it isn't worth doing.

STRUCTURED PROGRAMMING

The academics in computer science have gotten into the "structured programming" rut over the past several years. They claim that programs are more easily understood if the programmer uses some special language constructs and techniques. They don't all agree on exactly which constructs, of course, and the examples they use to show their particular point of view invariably fit on a single page of some obscure journal or another — clearly not enough of an example to convince anyone. When I got out of school, I thought I was the best programmer in the world. I could write an unbeatable tic-tac-toe program, use five different computer languages, and create 1000-line programs that WORKED. (Really!) Then I got out into the Real World. My first task in the Real World was to read and understand a 200,000-line FORTRAN program, then speed it up by a factor of two. Any Real Programmer

will tell you that all the Structured Coding in the world won't help you solve a problem like that — it takes actual talent.

Some quick observations on Real Programmers and Structured Programming:

- * Real Programmers aren't afraid to use GOTO's.
- * Real Programmers can write five-page-long DO loops without getting confused.
- * Real Programmers like Arithmetic IF statements — they make the code more interesting.
- * Real Programmers write self-modifying code, especially if it can save 20 nanoseconds in the middle of a tight loop
- * Real Programmers don't need comments — the code is obvious.
- * Since FORTRAN doesn't have a structured IF, REPEAT - UNTIL, or CASE statement, Real Programmers don't have to worry about not using them. Besides, they can be simulated when necessary using assigned GOTO's.

Data Structures have also gotten a lot of press lately. Abstract Data Types, Structures, Pointers, Lists, and Strings have become popular in certain circles. Wirth (the above-mentioned Quiche Eater) actually wrote an entire book contending that you could write a program based on data structures, instead of the other way around. As all Real Programmers know, the only useful data structure is the Array. Strings, lists, structures, sets — these are all special cases of arrays and can be treated that way just as easily without messing up your PROGRAMMING language with all sorts of complications. The worst thing about fancy data types is that you have to declare them, and Real Programming Languages, as we all know, have implicit typing based on the first letter of the (six character) variable name.

OPERATING SYSTEMS

What kind of operating system is used by a Real Programmer? CP/M? God forbid — CP/M, after all, is basically a toy operating system. Even "little old ladies" and grade school students can understand and use CP/M.

Unix is a lot more complicated of course — the typical Unix hacker never can remember what the "PRINT" command is called this week — but when it gets right down to it, Unix is a glorified video game. People don't do Serious Work on Unix systems: they send jokes around the world on UUCP-net and write adventure games and research papers.

No, your Real Programmer uses OS-370. A good programmer can find and understand the description of the IJK305I error he just got in his JCL manual. A great programmer can write JCL without referring to the manual at all. A truly outstanding programmer can find bugs buried in a 6 megabyte core dump without using a hex-calculator. (I have actually seen this done.)

OS is a truly remarkable operating system. It's possible to destroy days of work with a single misplaced space, so alertness in the programming staff is encouraged. The best way to approach the system is through a keypunch. Some people claim there is a Time Sharing system that runs on OS-370, but after careful study I have come to the conclusion that they were mistaken.

PROGRAMMING TOOLS

What kind of tools does a Real Programmer use? In theory, a Real Programmer could run his programs by keying them into the front panel of the computer. Back in the days when computers had front panels, this was actually done occasionally. Your typical Real Programmer knew the entire bootstrap loader by memory in hex, and toggled it in whenever it got destroyed by his program. (Back then, memory was memory — it didn't go away when the power went off. Today, memory either forgets things when you don't want it to, or remembers things long after they're better forgotten.) Legend has it that Seymore Cray, inventor of the Cray I supercomputer and most of Control Data's computers, actually toggled the first operating system for the CDC7600 in on the front panel from memory when it was first powered on. Seymore, needless to say, is a Real Programmer.

One of my favorite Real Programmers was a systems programmer for Texas Instruments. One day he got a long distance call from a user whose system had crashed in the middle of saving some important work. Jim was able to repair the damage over the phone, getting the user to toggle in disk I/O instructions at the front panel, repairing system tables in hex, reading register contents back over the phone. The moral of this story: while a Real Programmer usually includes a keypunch and lineprinter in his toolkit, he can get along with just a front panel and a telephone in emergencies.

In some companies, text editing no longer consists of ten engineers standing in line to use an 029 keypunch. In fact, the building I work in doesn't contain a single keypunch. The Real Programmer in this situation has to do his work with a "text editor" program. Most systems supply several text editors to select from, and the Real Programmer must be careful to pick one that reflects his personal style. Many people believe that the best text editors in the world were written at Xerox Palo Alto Research Center for use on their Alto and Dorado computers. Unfortunately, no Real Programmer would ever use a computer whose operating system is called SmallTalk, and would certainly not talk to the computer with a mouse.

Some of the concepts in these Xerox editors have been incorporated into editors running on more reasonably named operating systems — EMACS and VI being two. The problem with these editors is that Real Programmers consider "what you see is what you get" to be just as bad a concept in Text Editors as it is in women. No the Real Programmer wants a "you asked for it, you got it" text editor — complicated, cryptic, powerful, unforgiving, dangerous. TECO, to be precise.

It has been observed that a TECO command sequence more closely resembles transmission line noise than readable text. One of the more entertaining games to play with TECO is to type your name in as a command line and try to guess what it does. Just about any possible typing error while talking with TECO will probably destroy your program, or even worse — introduce subtle and mysterious bugs in a once working subroutine.

For this reason, Real Programmers are reluctant to actually edit a program that is close to working. They find it much easier to just patch the binary object code directly, using a wonderful program called SUPERZAP (or its equivalent on non-IBM machines). This works so well that many working programs on IBM systems bear no relation to the original FORTRAN code. In many cases, the original source code is no longer available. When it comes time to fix a program like this, no manager would even think of sending anything less than a Real Programmer to do the job — no Quiche Eating structured programmer would even know where to start. This is called "job security".

Some programming tools NOT used by Real Programmers:

- * FORTRAN preprocessors like MORTAN and RATFOR. The Cuisinarts of programming — great for making Quiche. See comments above on structured programming.
- * Source language debuggers. Real Programmers can read core dumps.
- * Compilers with array bounds checking. They stifle creativity, destroy most of the interesting uses for EQUIVALENCE, and make it impossible to modify the operating system. code with negative subscripts. Worst of all, bounds checking is inefficient.
- * Source code maintenance systems. A Real Programmer keeps his code locked up in a card file, because it implies that its owner cannot leave his important programs unguarded.

NutWorks Note

In the March, 1986 issue of *Benchmarks*, we printed an article about subscribing to *NutWorks* that included obtaining back issues. It should be noted that it is not currently possible to obtain back issues of *NutWorks* from MUSIC/SP because of the absence of a CMS type TELL command. If you are a CMS user, you can use the TELL command to get back issues, as in the following: **TELL CSNEWS AT MAINE SENDME NUTWORKS ISSUE009**
DO NOT send MAIL to these people, they will get *very* irritated.

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Benchmarks is a vital link between the NTSU Computing Center and the users of our facilities. It is important for all users of the computing facilities to maintain a file of these newsletters because they contain materials which will periodically update existing documents as well as information and suggestions on uses of OS/MVS, MUSIC/SP, the VAX Cluster, Microcomputers, and other resources available to NTSU students and faculty. To facilitate the dispersal of *Benchmarks*, *** **FREE** *** subscriptions are available. To receive yours, send the following information to us either by "snail mail" (the post office or campus mail) or electronically, through the MEMO facility on MUSIC/SP to AS04.

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